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ISOLATION AND CHARACTERIZATION OF VIOLET PIGMENTED BACTERIA *PSEUDOALTEROMONAS LUTEOVIOLACEA* FROM SELECTED CORAL REEF ECOSYSTEMS OF INDIA

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INTRODUCTION

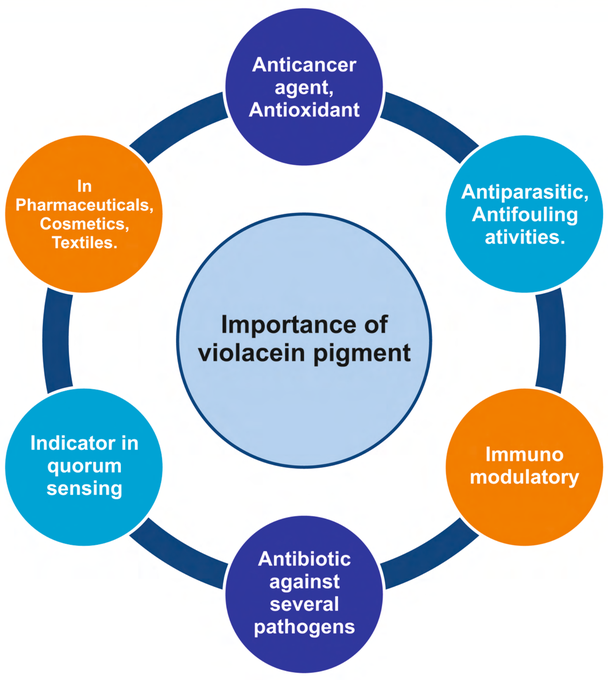
Coral reefs are considered as the rain forests of the ocean and are also one of the most vulnerable ecosystems on our planet, currently under direct threat from human activities.

Corals harbour diverse and abundant prokaryotic communities which are fundamental to the functioning, health and resilience of these coral reef ecosystems.

In this study we report isolation and characterisation of a deep violet pigmented bacterium *Pseudoalteromonas luteoviolacea*, from 2 distinct coral reef ecosystems. This forms the first report on isolation and characterisation of this bacterial species from India.

IMPORTANCE

P. luteoviolacea is a Gram-negative marine bacterium and member of the family Pseudoalteromonadaceae under Gammaproteobacteria and is known to biosynthesize several antimicrobial compounds, including the purple pigment violacein as well as the antibiotic compound indolmycin.



METHODOLOGY

Strain Isolation :

The violet pigmented bacterial strains viz., M64 was collected from *Acropora sp.* from Minicoy Island (8.27^{0}N, 73.05 ^{0}E) in Lakshadweep Sea and P42 from *Porites sp.* from Palk Bay (9^0 42' 51"N; 79^0 53' 13.5"E) in Tamil Nadu. The bacterial strains were isolated and characterised following standard protocols.

Growth Medium and Culture Conditions — **Marine agar 2216 (DIFCO), 26±2^{0}C**

Pigment production (violacein) — **Deep violet colonies on MA after 24 to 48 h incubation at 26±2^{0}C**

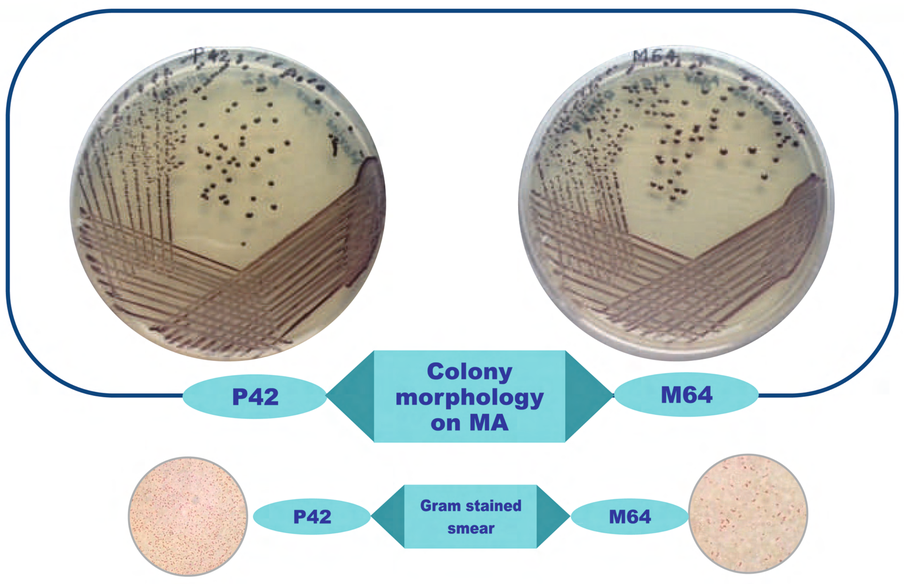
Biochemical Characterisation — **Characterised based on Phenotypic, Biochemical and Physiological features**

Molecular Characterisation — **16S rRNA Gene Sequence Analysis - using universal primers 27F and 1492R.**

RESULTS

PHENOTYPIC AND BIOCHEMICAL CHARACTERISATION

Colony morphology: Circular (3 to 5 mm in dia), regular, convex, opague colonies, deep violet pigmentation with intensity increasing on incubation



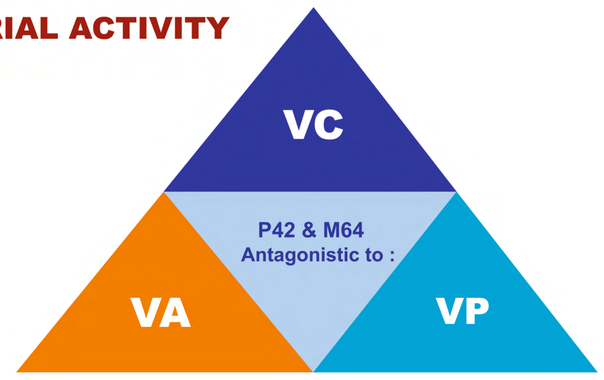
GRAM STAINING: Both strains Gram-negative, non-sporeforming, non-encapsulated rods.

PHENOTYPIC AND BIOCHEMICAL CHARACTERISTICS :

Biochemical Tests	Type strain	P42	M64
Motility	+	+	+
Indole production	-	-	-
ONPG	-	-	-
Violacein	+	+	+
Luminescence	-	-	-
Growth in NaCL (%) :			
0	-	-	-
3	+	+	+
6	+	+	+
8	-	-	-
10	-	-	-
Growth at (^{0}C) :			
4	-	-	-
20	+	+	+
37	-	-	-
0/129 sensitivity:			
10 µg	-	-	-
150 µg	-	-	-

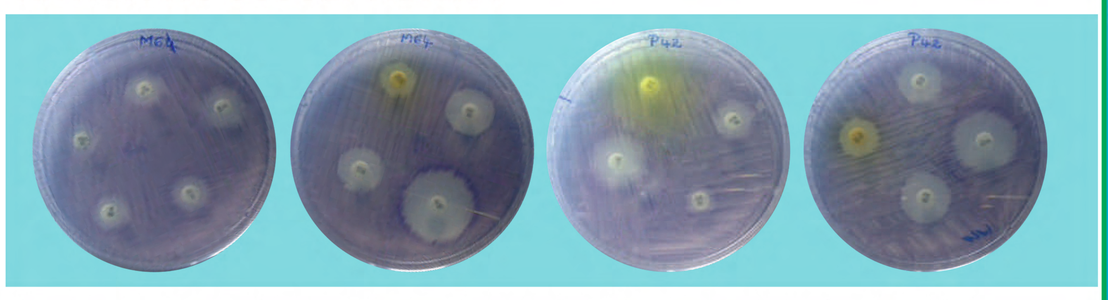
Biochemical Tests	Type strain	P42	M64
Growth at pH 6	-	+	+
Reduction of nitrates	-	-	-
Esculin	-	-	-
H_2S production	-	-	-
Citrate	-	-	-
Urease	-	-	-
Acid from :			
Glucose	-	Slight +ve	Slight +ve
Maltose	+	+	+
Trehalose	+	+	+
Enzyme activity :			
Amylase	+	+	+
Gelatinase	+	-	-
Caesinase	+	+	+
Lipase	+	-	-
Amino acid decarboxylation:			
Arginine	-	-	-
Lysine	-	+	+

ANTIBACTERIAL ACTIVITY



VC: ***Vibrio corallyticus*****; VA:** ***V. alginolyticus*****, VP:** ***V. parahaemolyticus***

ANTIBIOTIC SUSCEPTIBILITY



Both strains were sensitive to all the antibiotics tested except that P42 was found resistant to Trimethoprim and Penicillin G.

MOLECULAR CHARACTERISATION

16S rRNA gene sequence analysis and BLAST search showed >99 % similarity to *Pseudoalteromonas luteoviolacea.*

However, both the strains P42 and M64 differed in certain biochemical characteristics as depicted in the Table

CONCLUSION

Both strains of *P. luteoviolacea* P42 and M64 reported here are found to be potential source of anbiotics and antibacterial compounds specifically violacein.

ACKNOWLEDGEMENTS

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